UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,711	03/29/2005	Jill MacDonald Boyce	PU030225	2040

24498 7590 02/13/2008

Joseph J. Laks
Thomson Licensing LLC
2 Independence Way, Patent Operations
PO Box 5312
PRINCETON, NJ 08543

EXAMINER	
AN, SHAWN S	

ART UNIT	PAPER NUMBER
2621	

MAIL DATE	DELIVERY MODE
02/13/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/529,711
Filing Date: 3/29/2005
Appellant(s): Jill M. Boyce

Guy H. Eriksen
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/23/07 appealing from the Office action mailed 10/10/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Etoh (6,081,551)	6/27/2000;
Tanaka et al (4,663,665)	5/05/1987;
Bellers (6,782,054 B2)	8/24/2004;

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

I. Claims 1, 3-9, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Etoh (6,081,551) in view of Tanaka et al (4,663,665).

Regarding claim 1, Etoh discloses a video encoder (Fig. 1) for encoding video signal data for an image block and a plurality of reference picture indices, comprising

a reference weighting factor assignor (22a, 22b) responsive to the relative position between the image block (Input Image to 22a and 22b via 21a and 21b, respectively) and first and second reference pictures indicated by the plurality of reference picture indices (23, 24), wherein the reference picture weighting factor assignor determines respective implicit weighting factors for the first and second reference pictures (Fig. 5).

Etoh does not particularly disclose calculating respective implicit weighting factors for the first and second reference pictures based on respective distances of the image block to the first and second reference pictures.

However, Tanaka et al teaches TV system conversion apparatus comprising motion vector detecting method, wherein the method comprises calculating respective implicit weighting factors (Fig. 6d-6f) for the first and second reference pictures based on respective distances (Fig. 6d, MV's in Horizontal and Vertical direction) of the image block to the first and second reference pictures for preventing a deterioration in picture quality, thereby obtaining an improvement of picture quality by utilizing the motion-compensated interpolated signal (col. 7, lines 5-66).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a method for encoding video signal data for an image block as taught by Etoh to incorporate Tanaka et al's teaching as above so as to calculate respective implicit weighting factors for the first and second reference pictures based on respective distances of the image block to the first and second reference pictures for

preventing a deterioration in picture quality, thereby obtaining an improvement of picture quality by utilizing the motion-compensated interpolated signal.

Regarding claim 3, Etoh discloses a reference picture store (23, 24) in communication with the reference weighting factor assignor for providing a reference picture corresponding to each reference picture index.

Regarding claim 4, Etoh discloses a VLC (12) in communication with the reference weighting factor assignor for encoding the first and second reference picture indices.

Regarding claim 5, Etoh discloses a MC unit (22a, 22b) in communication with the reference weighting factor assignor for providing motion compensated reference pictures responsive to the reference weighting factor assignor.

Regarding claim 6, Etoh discloses a multiplier (Fig. 5, multiplying by 1/8) in signal communication with the MC unit and the reference weighting factor assignor for applying a weighting factor to a motion compensated reference picture (col. 8, lines 11-23).

Regarding claim 7, Etoh discloses prediction means (25) for forming first and second predictors (see switch selector, 27) from two different reference pictures.

Regarding claim 8, Etoh discloses two different reference pictures being both from the same direction relative to the image/picture block (Fig. 12).

Regarding claim 9, Etoh discloses a method for encoding video signal data for an image block, comprising:

receiving a substantially uncompressed image block (Fig. 1, Input Image);

determining implicit weighting factors (22a, 22b; Fig. 5) for the image block responsive to the relative positioning between the image block (Input Image to 22a and 22b via 21a and 21b, respectively) and first and second reference pictures indicated by the plurality of reference picture indices (23, 24);

computing motion vectors (21a, 21b) for the image block and each of the first and second reference pictures;

motion compensating (22a, 22b) each of the first and second reference pictures in correspondence with the respective motion vectors;

multiplying (Fig. 5, multiplying by 1/8) each of the motion compensated reference pictures by its calculated implicit weighting factor to form a weighted motion compensated reference picture (col. 8, lines 11-23);

combining each of the weighted motion compensated reference pictures into a combined weighted motion compensated reference picture (22a, 22b);

subtracting (10) the combined weighted motion compensated reference picture from the substantially uncompressed image block; and

encoding (5, 6) a signal indicative of the difference between the substantially uncompressed image block and the combined weighted motion compensated reference picture along with the corresponding indices of the first and second reference pictures. Etoh does not particularly disclose calculating respective implicit weighting factors for the first and second reference pictures based on respective distances of the image block to the first and second reference pictures.

However, Tanaka et al teaches TV system conversion apparatus comprising motion vector detecting method, wherein the method comprises calculating respective implicit weighting factors (Fig. 6d-6f) for the first and second reference pictures based on respective distances (Fig. 6d, MV's in Horizontal and Vertical direction) of the image block to the first and second reference pictures for preventing a deterioration in picture quality, thereby obtaining an improvement of picture quality by utilizing the motion-compensated interpolated signal (col. 7, lines 5-66).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a method for encoding video signal data for an image block as taught by Etoh to incorporate Tanaka et al's teaching as above so as to calculate respective implicit weighting factors for the first and second reference pictures based on respective distances of the image block to the first and second reference pictures for preventing a deterioration in picture quality, thereby obtaining an improvement of picture quality by utilizing the motion-compensated interpolated signal.

Regarding claim 11, Etoh discloses determining MV for the retrieved reference pictures relative to the image block (21a, 21b).

Regarding claim 13, Etoh teaches the relative positioning of an ordinary frames and the plurality of template pictures/frames corresponds to the relative display times of the respective pictures/frames (Fig. 21).

Therefore, it would have been considered obvious to one of skill in the art to realize that the relative positioning of the image block and the plurality of reference pictures/frames corresponds to the relative display times of the respective pictures/frames to be in sync, so that there is no interruption in displaying the respective image block and the plurality of reference pictures/frames in proper order/sequence.

II. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Etoh and Tanaka et al as applied to claim 9 above, and further in view of Bellers (6,782,054 B2).

Regarding claim 14, Etoh discloses testing within a search region for every displacement within a pre-determined offsets relative to the image block (Fig. 19a; col. 2, lines 18-48), and calculating SAD (26) of each pixel in the image block with a motion estimated reference picture.

Etoh does not particularly disclose selecting the offset with the lowest SAD and mean squared error as the motion vector.

However, Bellers teaches method and apparatus for MV estimation, wherein a block matching algorithm on the basis of regions or blocks for which a MV is being searched by comparing the pixel value contained in these blocks, and the evaluation is accomplished by using an error function such as SAD or means squared error, and the vector yielding the smallest (lowest) error is selected as the best match providing the best motion vector (col. 2, lines 62-67; col. 3, lines 1-12).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a method for encoding video signal data for an image block as taught by Etoh to incorporate Bellers' teachings as above so as to select the offset

with the lowest SAD and mean squared error as the (best) motion vector for providing an improved motion estimation.

(10) Response to Argument

Appellant's arguments filed on 11/29/07 in the appeal brief have been fully considered but they are not persuasive. The Appellant presents arguments contending the Examiner's rejections of:

Claims 1, 3-9, 11, and 13 being rejected under 35 U.S.C. 103(a) as being unpatentable over Etoh (6,081,551) in view of Tanaka et al (4,663,665); and

Claim 14 being rejected under 35 U.S.C. 103(a) as being unpatentable over Etoh and Tanaka et al as applied to claim 9 above, and further in view of Bellers (6,782,054 B2).

However, after careful consideration of the arguments presented, the Examiner must respectively disagree for the reasons that follow and submit to the board that the rejection be sustained.

The Appellant presents arguments of which cited prior art references do not teach or suggest:

i) "calculating respective implicit weighting factors for the first and second reference pictures based on respective distances of the image block to the first and second reference pictures" as recited in claim 1 (Appellant: page 14); and

ii) "calculating implicit weighting factors for the image block responsive to the relative positioning between the image block and first and second reference pictures indicated by the plurality of reference picture indices based on respective distances of the image block to the first and second reference pictures" as recited in claim 9 (Appellant: page 14).

However, after careful scrutiny of the cited prior art references, the Examiner must respectively disagree, and maintain the grounds of rejection for the reasons that follow.

In response to argument **i)**, Etoh discloses the reference picture weighting factor assignor (Fig. 1, 22a, 22b) calculating respective implicit weighting factors for the first and second reference pictures (Fig. 5)

Furthermore, Tanaka et al teaches calculating respective implicit weighting factors (Fig. 6d-6f) for the first and second reference pictures based on respective distances **(**Fig. 6d, Motion Vector *components* in Horizontal and Vertical direction, see ***Note*** below**)** of the image block to the first and second reference pictures for preventing a deterioration in picture quality, thereby obtaining an improvement of picture quality by utilizing the motion-compensated interpolated signal (col. 7, lines 5-58).

Note: By indicating Horizontal and Vertical directions, the prior art (Tanaka) refers to the components of the motion vector in X-axis and Y-axis directions, which are definitely defined as distances. Moreover, the broad recitation of distances does not limit Examiner's interpretation to limit himself in temporal domain.

In response to argument **ii)**, Etoh discloses calculating implicit weighting factors (22a, 22b; Fig. 5) for the image block responsive to the relative positioning between the image block **(**Input Image to 22a and 22b via 21a and 21b, respectively**)** and first and second reference pictures indicated by the plurality of reference picture indices (23, 24).

Etoh does not particularly disclose calculating respective implicit weighting factors for the image block responsive to the relative positioning between the image block and the first and second reference pictures indicated by the plurality of reference picture indices based on respective distances of the image block to the first and second reference pictures.

However, Tanaka et al teaches calculating respective implicit weighting factors (Fig. 6d-6f) for the first and second reference pictures based on respective distances **(**Fig. 6d, Motion Vector *components* in Horizontal and Vertical direction, see ***Note*** above**)** of the image block to the first and second reference pictures for preventing a deterioration in picture quality, thereby obtaining an improvement of picture quality by utilizing the motion-compensated interpolated signal (col. 7, lines 5-58).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a method for encoding video signal data for an image block as taught by Etoh to incorporate Tanaka et al's teaching as above so as to calculate implicit weighting factors for the image block responsive to the relative positioning between the image block and first and second reference pictures indicated by the plurality of reference picture indices based on respective distances of the image block to the first and second reference pictures for preventing a deterioration in picture quality, thereby obtaining an improvement of picture quality by utilizing the motion-compensated interpolated signal.

(11) Related Proceeding's Appendix

No decision rendered by a court or the board is identified by the Examiner in the Related Appeals and Interferences Section of this Examiner's answer.

For all of the reasons as set forth above, it is believed that the rejection should be sustained.

Respectively Submitted:

Shawn S. An
Primary Patent Examiner

Conferees:

Mehrdad Dastouri

Supervisory Patent Examiner

MEHRDAD DASTOURI
SUPERVISORY PATENT EXAMINER
TC 2600

THAI Q. TRAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Thai Tran

Supervisory Patent Examiner

Shawn S. An

Primary Patent Examiner

SHAWN AN
PRIMARY EXAMINER

2/10/08